IN THE CLAIMS

What is claimed is:

1. A rigid support structure, for use in conjunction with a circular endoscopic stapling instrument having a staple cartridge assembly and an anvil assembly, the staple cartridge assembly having at least one annular arrangement of staple slots and staples positioned in the slots, wherein the support structure maintains a resulting anastomotic lumen in an open condition, the support structure comprising:

a rigid annular ring configured and adapted to substantially overlie the at least one annular arrangement of staples of the staple cartridge assembly, the annular ring including:

an outer annular wall having a diameter;

an inner annular wall spaced a radial distance inward of the outer annular wall and defining a space;

an upper wall interconnecting the outer annular wall and the inner annular wall; and

a lower wall spaced a distance from the upper wall and interconnecting the outer annular wall and the inner annular wall, the outer annular wall, the inner annular wall and the upper and lower walls defining an interior reservoir; and

a wound closure material retained in the reservoir.

2. The support structure according to claim 1, wherein the diameter of the outer annular wall is substantially equal to an outer diameter of the staple cartridge assembly and wherein the diameter of the inner annular wall is radially inward of the at least one annular arrangement of staples.

3. The support structure according to any of the preceding claims, wherein the annular ring has a cross-sectional profile selected from the group consisting of circular, rectilinear, ovular, triangular and arcuate.

4. The support structure according to any of the preceding claims, further comprising a support spoke integrally connected to and extending diametrically across the inner annular wall.

5. The support structure according to any of the preceding claims, wherein the anvil assembly includes an elongated shaft, and wherein the support spoke includes a

central hub having a central axial opening formed therethrough, wherein the central axial opening is configured and dimensioned to receive the shaft of the anvil assembly therethrough.

6. The support structure according to any of the preceding claims, wherein the wound closure material is at least one of an adhesive, a hemostat and a sealant.

7. The support structure according to claim 6, wherein the adhesive is selected from the group consisting of protein derived materials, albumin/glutaraldehyde materials, and cyanoacrylate-based materials.

8. The support structure according to claim 6, wherein the sealant is selected from the group consisting of fibrin based materials, collagen-based materials, synthetic polymer-based materials, synthetic polyethylene glycol-based materials, and hydrogel materials.

9. The support structure according to claim 6, wherein the hemostat is selected from the group consisting of fibrin-based materials, collagen-based materials, oxidized regenerated cellulose-based materials, gelatin-based materials, and fibrinogen-thrombin combination materials.

10. The support structure according to any of the preceding claims, wherein at least one of the annular outer wall and the annular inner wall is comprised of a rigid material.

11. The support structure according to any of the preceding claims, wherein the rigid material is selected from the group consisting of stainless steel and titanium.

12. The support structure according to any of the preceding claims, wherein the rigid material is a bioabsorbable material.

13. The support structure according to any of the preceding claims, wherein the rigid annular ring includes a plurality of interstitial spaces extending therethrough, the

spaces being configured and adapted to allow the legs of the staples to pass through the spaces.

14. The support structure according to any of the preceding claims, wherein the rigid annular ring has a plurality of cartridge orientation members adapted to orient the spaces of the annular support structure to radially and circumferentially overlie the staple slots of the staple cartridge assembly.

15. The support structure according to any of the preceding claims wherein the cartridge orientation members are a plurality of nubs extending therefrom, wherein the nubs are spaced from each other and are adapted and configured to engage complementary recesses formed in the distal end surface of the staple cartridge assembly.

16. A method for reinforcing an anastomotic lumen of a hollow body, comprising the steps of:

cutting said hollow body into a pair of severed sections;

inserting an anvil assembly of a circular stapling apparatus into one of said pair of severed sections of said hollow body such that a shaft of said anvil assembly extends out of a terminal end of said one of said pair of severed sections;

suturing said terminal end of said one of said pair of said severed sections around said shaft of said anvil assembly;

inserting a staple cartridge assembly into an other of said pair of severed sections such that the open end of the cartridge assembly faces the open end of the severed sections of the hollow body;

suturing said terminal end of said other of said pair of said severed sections;

providing a rigid reinforcing lumen ring between said anvil assembly and said staple cartridge assembly such that when said circular stapling apparatus is fired, surgical staples penetrate said terminal ends of said pair of severed sections and said reinforcing lumen ring;

coupling and approximating said anvil assembly to said staple cartridge assembly; and

firing said circular stapling apparatus.

17. The method according to claim 16, comprising providing said reinforcing lumen ring between said terminal ends of said pair of severed sections.

18. The method according to claim 16 or 17, comprising providing said reinforcing lumen ring between said anvil assembly and said one of said pair of severed sections.

19. The method according to claim 16, 17 or 18, comprising providing said reinforcing lumen ring between said staple cartridge assembly and said other of said pair of severed sections.

20. The method according to claim 16, 17, 18 or 19, wherein said reinforcing lumen ring is centrally aligned with said anvil assembly and staple cartridge assembly.

21. The method according to claim 16, 17, 18, 19, 20 or 21, further comprising the step of orienting and aligning the reinforcing lumen ring with the staple cartridge assembly.

22. The method according to claim 16, 17, 18, 19, 20 or 21, wherein the reinforcing lumen ring includes interstitial spaces defined by a plurality of legs extending substantially in a radial direction, wherein a plurality of the legs traverse a plurality of staple slots of the staple cartridge assembly.